Federal Aviation Administration

Video and Multimedia Products

Participant Guide

Table of Contents

Video and Multimedia Products Participant Guide

Introduction

Overview of Participant Guide

The Participant Guide provides the specific documents and resource information presented during the Video and Multimedia Products training. Copies of the Power Point slides utilized during the training are included. Also provided are reference sources and examples relating to the provision of captioning for video files and audio descriptions for audio files.

The instructor will direct you through the power Point slides and the resource materials provided in the participants guide during the training.

Elements of the Guide

The Participant Guide includes:

- Video and Multimedia Products Power Point Slides
- Participants notes
- Captioning tools, techniques and examples
- Audio Description tools, techniques and examples
- Video and Multimedia products information and materials

Video and Multimedia Products Participant Guide

Welcome participants to the Video and Multimedia Products training.

- Each participants should have signed the registration list and received a name tag
- The FAA Video and Multimedia Products training will focus on the Section 508 Video and Multimedia Products technical standards developed by the Access Board (1194.24).
- This training will present the technical standards and provisions required for the accessibility of FAA video and multimedia products by individual with disabilities who utilize assistive technology.
- This training will provide captioning tools, techniques and examples for the captioning of video files.
- This training will provide audio description tools, techniques and examples for providing audio descriptions and text alternatives for audio files.

The Video and Multimedia Products training will present:

- Explanation of the Section 508, 1194.24, requirements for Video and Multimedia Products.
- Captioning tools such as SMIL, Quick Time and SAMI for creating and displaying captions in multimedia content.
- Captioning techniques such as how to utilize the web based tool MAGpie to add and export captions to multimedia media formats like SAMI, SMIL and QuickTime.
- Audio description tools, techniques and examples from the NCAM Rich Media Accessibility Center.
- Audio description techniques such as how to utilize the web based tool MAGpie to write and record audio descriptions.
- Various captioning and audio description tutorials and examples will be provided for FAA employees to utilize in creating captions for video files and audio descriptions for audio files.

The goal of this training is that when you're finished with this training module, you should understand:

- The technical provisions of the Video and Multimedia Products Technical Standards (1194.24)
- The difference between open and closed captioning and when to utilize in the PC environment.
- Captioning tools and techniques for creating and displaying captions in video files.
- Multimedia formats for adding captions to multimedia content; SAMI, SMIL, QuickTime and MAGpie.
- The process for captioning live and pre-recorded video
- Audio description tools and techniques for creating and displaying audio descriptions in audio files.

- The use of the web based tool MAGpie for writing and recording audio descriptions
- An overview of the NCAM Rich Media Accessibility tutorials, tools and examples available for learning more about captioning and audio description.

The information provided in this Video and Multimedia Products training has been divided into the following parts:

- Part 1: Access Board Video and Multimedia Products Technical Standards (1194.24)
- Captioning Tools, Techniques and Examples
- Audio Description Tools, Techniques and Examples
- Part 2: Video and Multimedia Products Resources

Part 1: Access Board Video and Multimedia Technical Standards

This section of the training outlines will cover the following:

- Section 508, 1194.24, requirements for Video and Multimedia Products Technical Provisions.
- Video and Multimedia Products Access Board Technical Assistance Guide
- FAA Video and Multimedia FAQ

The major point of this training is that inaccessible video and multimedia products interfere with users of assistive technology ability to obtain and use information quickly and easily.

- IT should increase the availability of resources to person with disabilities - barrier-free designs opens doors to this greater audience
- Accessible design bridges the digital divide that locks out people from participating in the workforce on the basis of disability
- Increases individual with disabilities ability to work in a professional and supported work environment
- Accessible IT increases the number of individuals with disabilities ability to receive the FAA message
- Accessible design minimizes risks of non-compliance

Access Board Technical Standards: Video and Multimedia Products (1194.24)

Introduction to the Video and Multimedia Technical Standards

Video and Multimedia products involve more than one media, included but not limited to**:**

1. Video programs – closed captioning and text documents
2. Narrated Slide Presentations – text document
3. Computer Generated Presentations - PowerPoint

Video and Multimedia Provisions Address:

1. Caption Decoder Circuitry (screen larger than 13 inches
2. Secondary Audio Channels for television units including tuner cards for use in computers

Video and Multimedia Provisions Require:

1. Captioning
2. Audio Description for certain training
3. Informational multimedia productions developed or procured by Federal agencies

FAA EIT Accessibility Standards Summary:
Video and Multimedia Products (1194.24)

a) All analog television displays 13 inches and larger, and computer equipment that includes analog television receiver or display circuitry, shall be equipped with caption decoder circuitry which appropriately receives, decodes, and displays closed captions from broadcast, cable, videotape, and DVD signals. As soon as practicable, but not later than July 1, 2002, widescreen digital television (DTV) displays measuring at least 7.8 inches vertically, DTV sets with conventional displays measuring at least 13 inches vertically, and stand-alone DTV tuners, whether or not they are marketed with display screens, and computer equipment that includes DTV receiver or display circuitry, shall be equipped with caption decoder circuitry which appropriately receives, decodes, and displays closed captions from broadcast, cable, videotape, and DVD signals.

b) Television tuners, including tuner cards for use in computers, shall be equipped with secondary audio program playback circuitry.

c) All training and informational video and multimedia productions which support the agency's mission, regardless of format, that contain speech or other audio information necessary for the comprehension of the content, shall be open or closed captioned.

d) All training and informational video and multimedia productions which support the agency's mission, regardless of format, that contain visual information necessary for the comprehension of the content, shall be audio described.

e) Display or presentation of alternate text presentation or audio descriptions shall be user-selectable unless permanent.

Access Board Technical Assistance Guide for Video and Multimedia Products

a) **What television display formats are required to include caption decoder circuitry?**
Analog and digital television displays, as well as stand-alone digital television tuners and computer equipment that includes digital television receiver or display circuitry, must include caption decoder circuitry. Section 508 does not require small analog or digital television displays to include caption decoder circuitry. Specifically, analog televisions with screens smaller than 13 inches diagonally and DTVs with displays smaller than 7.8 inches vertically are exempted.

Related Legislation with similar provisions:

The Television Decoder Circuitry Act of 1990

The Telecommunications Act of 1996

What are captions?
Like subtitles, captions display spoken dialogue as printed words on a television screen or computer monitor. Unlike subtitles, captions are specifically designed for hard-of-hearing and deaf viewers to enable their full participation when viewing video or multimedia productions. Captions are carefully placed to identify speakers. They often include information regarding on- and off-screen sound effects, such as music or laughter. Captions also hold secondary benefits for people who are learning a foreign language, learning how to read, or watching TV in a noisy area, as well as those who understand best by processing visual information.

Captions come in two forms: open or closed captioning:

- *Open captions* are displayed automatically as part of the video, without having to be selected by the user.

- *Closed captions* normally do not appear as part of the video portion of a multimedia presentation unless the viewer has selected them to appear. The person viewing the presentation must be using technology that includes a closed caption decoder. The decoder will allow the otherwise-hidden data within the television signal to be displayed on the user's TV screen or computer monitor. Many newer television models allow viewers to toggle captions on or off with ease.

(b) Television tuners, including tuner cards for use in computers, shall be equipped with secondary audio program playback circuitry.

What is a secondary audio channel and why is special circuitry required?
The most common method of broadcasting audio description is through the Secondary Audio Program (SAP) feature of stereo televisions. Each television channel has what is called a "secondary audio channel" associated with it. The secondary audio channel may contain audio descriptions or foreign language translations of dialogue. If used to deliver audio descriptions, SAP can greatly enhance the multimedia experience for those who are blind or who have low

vision. When television tuners, including tuner cards for use in computers, are equipped with SAP playback circuitry, people who are blind or who have low vision may access whatever audio description has been associated with the presentation.

How do audio descriptions assist people with disabilities?
An "audio description" is an audible description of the visual content of a presentation, synchronized with the existing soundtrack. Typically, appropriate portions of the audio description are narrated during what would otherwise be natural silences in the presentation.

What is a tuner card?
Tuner cards enable a computer to receive television broadcasts. This product is an example of what the industry calls "convergence" and represents a way in which the functions historically provided by TV, PC, cable and Internet products are merging onto multi-function devices. Tuner cards can be internal or external and can work with laptop or desktop computers.

(c) All training and informational video and multimedia productions which support the agency's mission, regardless of format, that contain speech or other audio information necessary for the comprehension of the content, shall be open or closed captioned.

(d) All training and informational video and multimedia productions that support the agency's mission, regardless of format, that contain visual information necessary for the comprehension of the content, shall be audio described.

What is a multimedia production?
The term "multimedia productions" refers to productions that present information in more than one sensory mode, e.g., both audibly and visually. For instance, streaming video with a soundtrack is a multimedia production. A show broadcast through a Federal military radio station is audio only and therefore not covered by this captioning requirement. (However, the procurement of electronic and information technology necessary to operate the radio station would be covered under the 508 standard.)

What does it mean for a video or multimedia production to "support the agency's mission?"
Video and multimedia products that "support the agency's mission" are generally required to be captioned and audio-described. For instance, a training film for the Social Security Administration regarding how agency personnel should determine an applicant's eligibility for benefits, is a training production that supports the agency's mission. A video of a retirement celebration, on the other hand, would not be "in support of an agency's mission" and is not covered by these provisions.

Raw videotaped footage recorded by a field investigator to document a safety violation could be considered a film "in support of an agency's mission". However, it is not a "production"

and therefore does not need to be captioned or audio described. On the other hand, if such footage were subsequently incorporated into agency training or an informational presentation, it would have to be captioned and audio described.

When are captioning and audio descriptions required?
Captioning and audio descriptions are only required to be provided when important to understand the audio or visual components of a video or multimedia production. That is, even if a production "supports the agency's mission," only those audio portions that are necessary for the comprehension of the production's content need to be captioned.

Ex: A videotaped lecture would need to capture the lecturer's words in captions if it is intended to be used for future training, but the captions need not also relate that students' chairs were squeaking or that the door at the back of the room was closing loudly as people exited.

Similarly, only those visual portions that are necessary for the comprehension of the production's content need to be audio described.

Ex: A videotaped lecture would need to include an audio description of graphics the lecturer draws on a chalkboard to illustrate a point, but would not need to include an audio description of the strictly verbal – or "talking heads" – portion of the lecture.

If I believe that no one with a hearing loss will see the video, do I still have to caption it?
Yes, unless an exception applies (e.g., electronic and information technology that is part of a national security system is not required to adhere to the Access Board's provisions), section 508 requires accessibility features to be built into new multimedia products as called for in this technical provision. Section 508 generally focuses on how the technology is designed, rather than who may use it.

Agencies will likely find that captions will assist many nondisabled individuals as well, including those who otherwise have normal hearing but are "functionally hard of hearing" in rooms with poor acoustics due to echoes or noisy ventilation, those who are learning English as a second language, and individuals with auditory processing disabilities. Finally, many people simply learn best if information is presented in more than one sensory mode, such as hearing while simultaneously reading the dialogue.

(e) Display or presentation of alternate text presentation or audio descriptions shall be user-selectable unless permanent.

Does this provision apply differently to audio description than it does to captioning?
Given the current state and prevalence of analog technology, the "user-selectable" language generally applies to closed captioning, which the viewer can turn on or off. Audio description

on VHS format videos is permanently encoded and is always "on." If a user wanted to watch a video without listening to the audio description, he or she would need to find a separate version of the production that was not audio described. The same is true with open captioning.

CD-ROMs, DVDs, and other digital forms of multimedia can support alternate audio channels for audio description. Using SMIL (Synchronized Multimedia Integration Language) or other emerging technologies, captioning and audio description will likely be more easily integrated into digital multimedia presentations in the near future.

Another point bundled in this provision relates to difficulty users have reported with independently enabling audio description. The means of choosing alternate tracks for audio description varies by the medium, but usually involves selection from an on-screen menu. Therefore those menus must be made audible or otherwise readily selectable so that people with visual disabilities can independently gain access to audio descriptions.

FAA Video and Multimedia Frequently Asked Questions

1. Do I need captioning if my targeted audience does not need captioning?
Answer: Yes, the EIT Accessibility Standards state "...Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation...". At present this method is captioning.

2. Do I need to retrofit my existing videos?
Answer: No but you must provide reasonable accommodation upon request. If you have videos that are popular you may want to consider adding captioning.

3. I am making training videos under an existing contract, do I need to provide captioning?
Answer: You need to contact the Section 508 Procurement Legal point of contact (POC) to correctly answer this question.

4. If I am doing Netmeeting do I need to provide captioning or alternative formats?
Answer: We are looking into this issue and have directed the question to the Access Board for comments

Captioning

This section of the training outlines will cover the following:

- Captioning tools, techniques and examples for video and multimedia presentations on the Web.
- Overview of Rich Media Players Formats
- Real Media Player, Windows Media Player, Apple Quick Time
- Overview of Multimedia Captioning Methods
- SMIL, SAMI, Apple Quick Time

What is Captioning?

Captioning turns the audio content of a visual presentation into text. It is the alternative format used to deliver audio content for individuals who are deaf and/or hard of hearing. Watching a multimedia event such as a news program would make little sense without audio. To make this content accessible to those who are deaf, text captioning can appear on the screen.

Captions were initially developed for television. Like movie subtitles, television captions display spoken dialogue as printed words on the screen. Television captions are carefully placed to identify speakers, on- and off-screen sound effects, music, and laughter. A set-top decoder must be used to decode, or open, the captions. Television captions are called closed because they start out turned off and, after they have been decoded to become part of the television picture, they are called open.

Captions typically appear on the screen as a group and erase as a group, they do not scroll. There are two types of captions:

Open or Closed Captioning

Open Captioning

Open captioning embeds the text permanently on the same layer as the video signal, so you cannot turn it off. This type of captioning can sometimes cover up text (e.g., a speaker's name and title) displayed at the bottom of the screen. Since most TVs have the capability to decode closed captioning, you may not need to use open captions except in special circumstances.

Closed Captioning

In this type of captioning, the text equivalent of the audio material is placed on a separate layer or channel so users can turn it on and off. Use this format whenever possible, since it allows users to decide whether or not to display captions. When showing videos in a public setting, however, you should usually display the captions. When you display captions, you reduce the chance of persons with auditory disabilities missing the audio portion of the video.

A decoder converts the captioning signal into the captions displayed on screen. This decoder is internal in most new TVs, but external decoding devices can also be purchased (although a new TV may be less expensive). Before purchasing, however, ensure the decoder device is compatible with the TV it will be used with.

Captioning the PC Environment

In a PC environment, an open caption is a caption that cannot be turned off — it is part of the static or dynamic image file; it is *painted* in the picture pixels.

In a PC environment, a closed caption is caption text that can be turned on or off, formatted programmatically, and even styled by the user.

When to Use Open Captions

In a computer environment, open captions are simply an additional track that is added at the end of a video production process. They are embedded in the media file itself, and therefore are readable by any player. For example, any MPEG movie that contains open captions can be played in any multimedia player with MPEG decoder support.

In contrast, both TV and computer closed captions require a caption decoder. In the case of TV, it's a literal decoder; a set-top box or chip that decodes the video signal. For computers, you need a browser (for example, Microsoft Internet Explorer) or player (for example, Windows Media Player) that can *decode*, or parse the caption text, which is stored in an additional file.

Use Open Captions when:

- You are not sure that your media file(s) will be read by a browser or player that can read the caption text.
- You are not able to specify which player will be used. Because there are competing standards and implementations, it may be too costly to create caption text for multiple players.

Note Be sure that the video will be viewed at a high-enough resolution, or have a large-enough screen dimensions, so that the open captions can be read. Because open captions are embedded in the media file, they "shrink" to whatever size and resolution at which the media is viewed.

When to Use Closed Captions

In computer multimedia, closed captions allow much greater design flexibility than open captions; however, the trade-off is cost. If you can specify the browser or player that your media file will be played in, the cost can be minimized. In general, use closed captions when any of the following is important:

- Allowing authors or users to control characteristics of the caption text, such as its location on the screen, its font, and its font size.

- Ability to create and edit caption text in postproduction, for example, to add captions to an existing movie.
- Ability to translate caption text to different languages.

How Video Works on the Web!

Real-Time Video Streamed or Captioned Video

The most straightforward method is to convert the video to a digital format with the captions displayed. In essence, this would result in an "open captioned" digital video file. However, other options available that provides a more user-friendly experience.

Without captions, rich media that incorporates sound is likely to be inaccessible to individuals who are deaf and/or hard of hearing. Sound often plays an important role in communicating the author's message in rich media. The ability to create and add captions to video on demand, recorded Web Casts and to multimedia files through rich media players is dominated by the following three formats:

Real Media Player

Apple Quick Time

Windows Media Player

Each of these formats compresses audio and video when uncompressed video demands an enormous amount of disk space. Each of these formats also stream their media. This means that the user does not have to download the entire video into the computer's memory to view it. The user clicks on a video link and the video starts playing after a small portion of the entire video is downloaded. As you are watching the video, the rendering software is loading and then playing small chunks of the media.

These captions can be used in multimedia files streamed over the Internet, an intranet, from a CD, or embedded in a computer-based application or PowerPoint presentation.

To demonstrate accessibility features in Real Player

- Open Real Player Program
- Click on the View Menu and select Preferences
- Click on the Content Tab
- Click on the Settings button under the heading Accessibility
- Ensure the "Use accessibility features when available" box is checked
- Select the "Show Captions" radio button
- Click OK and then click OK again to exit the preference dialog box
- Play the video (You may need to quit and restart Real Player for settings to take effect.

Real Media Player Tutorials

RealNetworks G2 Basics -- from Streaming Media World

RealSystem G2 and SMIL documentation -- From WebDeveloper.com.

RealText and SMIL documentation -- From WebDeveloper.com, The follow-up to "RealSystem G2 and SMIL".

Tutorial: Creating Captions for Rich Media

There are currently three major methods of creating and displaying captions in multimedia:

The World Wide Web Consortium's Synchronized Multimedia Integration Language (SMIL) Tutorials

SMIL tutorial from Helio -- A great overview of how SMIL works.

SMIL tutorial from CWI -- Another great overview (in PDF slides).

Learning to SMIL with a SMIL -- A SMIL tutorial, presented in SMIL.

Apple's QuickTime Tutorials

QuickTime Basics -- from Streaming Media World.

Captioning QuickTime Movies with HREF Tracks -- captioning movies with HREF track, from Swarthmore.

Adding Text Tracks to your QuickTime Movies -- Tutorial on creating text tracks.

Quick Time and SMIL -- Tutorials on a wide variety of QuickTime topics.

Creating Rich Media with QuickTime -- From StreamingMedia.com

Microsoft Windows Media Player Tutorials

Windows Media Tutorial -- from Streaming Media World.

Guide to adding closed captions to multimedia -- Captioning in SAMI from Microsoft.

None of these methods can fully enable real-time captioning display or description output and

none of these technologies can import analog televisions line-21 closed caption data.

NCAM's MAGpie version 2.01 is an application for creating captions and audio description

NCAM Rich Media accessibility Web site which includes

- Showcase of examples of media with different sorts of captions
- Learning area where developers can learn specific techniques to assist their work in creating captions.

MAGpie (Media Access Generator) is a tool designed to make it easy for multimedia content developers to add captions to their audio and video content. MAGpie provides an environment for developers to listen to their content, add captions, and synchronize the captions to the content by adding a time code to each event. MAGpie can then be used to add and then export the captions to three multimedia formats:

The World Wide Web Consortium's Synchronized Multimedia Integration Language (SMIL)

Apple's QuickTime,

Microsoft's Synchronized Accessible Media Interchange (SAMI) format.

MAGpie can also integrate audio descriptions into SMIL presentations

Real Time Captions

Unfortunately, there are only a few vendors that offer captioning services for live, unscripted Web casts & Web conferencing events. They typically transmit captions via a Web page (using a Java applet), WebChat, iChat, America Online, Compuserve or a proprietary platform. If you can't use one of these services, you'll still need to provide an alternative means such as a computer-aided real time (CART) display system or a chat program (e.g., AOL Instant Messenger) to transmit audio in a text format.

Keep in mind that if you have a completely scripted program that you are broadcasting live, you can easily create captions using the script.

Real-Time Webcasting Captioning Vendors

The following vendors advertise real-time captioning services for webcasts:

Speche; www.speche.com/e_scription.asp
Rapidtext; www.rapidtext.com/sub/textcast.htm
RealTime Reporters; www.rtreporters.com

For the latest services offered by available vendors, view the complete list on the "Closed

Captioning Web" site at www.captions.org/alphalinks2.cfm.

Real-Time Captioning List

This listing is not an endorsement by the FAA on the vendors listed below. This list is provided as a reference and the FAA does not verify the accuracy of this list or the quality of work by the vendor.
If you know of additional vendors please feel free to submit their names.

Alderson Reporting Company, Inc.
1111 14th Street, NW, 4th Floor
Washington, DC 20005
Phone: 202-289-2260
Fax: 202-289-2221
Email: Nancy@aldersonreporting.com

Block Court Reporting
733 15th Street, NW Suite 937
Washington, DC 20005
Brooke Marcus, Director of Operations
Phone: 202-638-1313 or 800-735-3376
Fax: 202-638-3740
Email: block@blocknet.com

Caption Reporters
Lorraine Carter, President
700 North Fairfax St., Suite 302
Alexandria, VA 22314
Phone: 703-638-2300
TTY: 703-683-5288
Fax: 703-683-5289
Web: www.CaptionReporters.com
Email: caption@earthlink.net

Com Access
Relay/TTY: 301-570-8000
Email: interpcart@aol.com

Communique Interactive Solutions, Inc.
Kimberly Turnage, Captioning Director
Marguerite Bardone, Media Director
P.O. Box 4814
Richmond, VA 23220
Phone/TTY: 804-355-6400
Fax: 804-354-9625

Email: CISinc1@aol.com

Computer Prompting & Captioning Co.
Sid Hoffman
1010 Rockville Pike, Suite 306
Rockville, MD 20852
Phone: 301-738-8487 or 800-977-6678
TTY: 301-738-8489
Fax: 301-738-8488
Web: www.cpcweb.com
Email: info@cpcweb.com

Shirley Jones & Associates, Inc.
1738 Elton Road #125
Silver Spring, MD 20903
Phone: 301-431-3900 or 888-SJA-DEPO
Fax: 301-431-2134
Email: SJAword@erols.com

Metro Reporters, Inc.
Karen McConnell and Devy Khou
8344 Traford Lane D-2
Springfield, VA 22152
Phone: 703-644-9761
Fax: 703-643-3039
Email: Metro@erols.com

National Captioning Institute
Daphane Johnson
Phone: 703-917-7623
Email: djohnson@ncicap.org

Oak Grove Reporting
Carol Epperley
15-D Loudon Street, SW
Leesburg, VA 22075
Phone: 703-771-1844 or 800-273-0791
Fax: 703-771-1895
Email: Oakgrove@erols.com

Platt & Dawson, Inc.
Laurel P. Platt, CRR, RMR
10195 Main Street, Suite M
Fairfax, VA 22031
Phone: 703-591-0007
Fax: 703-591-2101

Email: plattdawson@erols.com

James M. Turner (Jack)
10510 Sideburn Court
Fairfax, VA 22032
Phone: 703-425-0139
Fax: 703-764-9318

The Process of Captioning Live Video

At the present time, there is only one way to caption live video. A stenocaptioner uses a special stenographic keyboard to type as many as 250 words per minute. A computer translates the steno into English text and formats it correctly to display as captions. The caption data is then sent to an encoder and inserted into line 21 of the video signal before being broadcast to TVs across the country!

If you have a live, scripted program, you may be able to take advantage of computer software and hardware that converts the script into captions beforehand and integrates them with the live video feed.

Live stenocaptioners are generally very highly skilled. The best of the live captioning services claims a 99% accuracy rate; however this reliability varies greatly among the available vendors. By transmitting the signal through a telephone line, captioners can work from a remote location.

Process for Captioning Pre-Recorded Video

Captioning pre-recorded video is often more expensive than live television, but provides more options and produces almost 100% accuracy. In addition, since offline captioning of pre-recorded video is not speed-critical, anyone with decent typing and English (i.e., spelling and grammar) skills can edit captions.

The two common types of caption placements

Timed Roll-Up Captions

This type of captioning scrolls up onto and off of the screen in a continuous two- to four-line display. It is the only type used for real-time video, but it can also be applied to post-production videos.

Roll-up captions are usually verbatim. Each new sentence begins a new row, and each speaker change is indicated with a speaker-change symbol (two "greater-than" symbols plus a space). The FCC decoder specification allows roll-up captions to be relocated to various vertical screen placements by the caption provider. If you use this feature, bear in mind that existing set-top adapters will continue to display roll-up captions at the bottom of the picture. It is advisable, therefore, to include any identifying information that may be obscured by the

captions. For example:

>> Smith: WELCOME TO
THE CITY OF LINCOLN.
WE HOPE YOU WILL BE ABLE
TO SPEND SOME TIME
IN OUR HISTORIC DISTRICT.
>> James Moore, Long-time
Lincoln resident: THE HISTORIC
DISTRICT IS LOCATED AT
THE NORTH END OF TOWN.
YOU CAN REACH IT BY CAR,
TRAIN OR BUS.

Timing
Roll-up captions are timed with audio. A new caption row is generally displayed just as the speaker begins to say the first words in the row. The caption display is usually erased when there is a significant pause in the audio.

Pop-on Captions

This type of captioning appears in one to three lines, placed on screen near the associated speaker. This is more aesthetically pleasing since it conveys when each character is speaking. These captions often also indicate sound effects, music, or other audio information.

There are five basic steps involved in creating pop-on captions:

The video dialogue is transcribed.

1. The script is formatted to include natural pauses in the dialogue.
2. (Pop-on captions only) Each line of dialogue is positioned with the appropriate speaker.
3. The captions are synchronized with the audio.
4. The new videotape is recorded with the encoded captions.

A pop-on caption is usually one or two rows long. When a sentence must be divided into two or more captions, break it at a logical phrase rather than at a random point. For example:

Preferred:	To be avoided:
MY, WHAT DANGEROUS GAMES WE USED TO PLAY IN THE RUINS OF THIS CITY.	MY, WHAT DANGEROUS GAMES WE USED TO PLAY IN THE RUINS OF THIS CITY.

If a caption has more than one row, break the row in a similarly logical place:

Preferred:	To be avoided:
MY, WHAT DANGEROUS GAMES USEDWE USED TO PLAY...	MY, WHAT DANGEROUS GAMES WE TO PLAY...

A period usually indicates the end of a caption, and the next sentence starts with a new caption. For example:

Preferred:	To be avoided:
WELCOME TO THE CITY OF LINCOLN.	WELCOME TO THE CITY OF LINCOLN. WE HOPE
WE HOPE YOU ENJOY YOUR STAY.	YOU ENJOY YOUR STAY.

Captioning VHS Videos

In-House Post-Production Video Captioning:

Consider this process for videos that are:

- Your videos contain sensitive (or classified) information.
- Your video/multimedia projects are extensive.
- Your lead time is typically too short to feasibly outsource.

Unlike creating text files to generate captions for multimedia files, captioning standard videos in-house requires more specialized equipment for each stage of the captioning process:

- Editing.
- Encoding.

Editing Video Captions

To create and edit captions, you'll need captioning software as well as a computer that runs the software. Besides meeting the requirements of the captioning software, the computer will also need:

- A video source (e.g., a computer-controlled video tape recorder).
- A timecode reader.
- A way to display the video.

Encoding Video Captions

Encoding the captions onto a video requires:

- A computer with encoding software (some caption editing packages include this).
- Two video tape recorders – one to play the original master tape and one to record the new captioned submaster tape.
- A caption encoder device to place the captions on the videotape.

Captioning live events requires different equipment and much more specialized skills. You still need a computer, captioning software, and an encoder. However, you also need to purchase and become proficient on a steno keyboard, which looks nothing like a typical computer keyboard. Stenocaptioners typically receive specialized training similar to court reporters and can type about 250 words per minute with a total error rate less than 1.5%! You would also need to learn how to use a stenocaptioner's dictionary, which includes a wide variety of specialized terms and phrases.

For these reasons alone, it's suggested that you outsource live captioning. If you want to pursue this option further, however, consider reviewing the document "Suggested Styles and Conventions for Closed Captioning" assembled by the WGBH Caption Center.

Audio Description

This section of the training outlines will cover the following:

- Audio Description tools, techniques and examples from the NCAM Rich Media Accessibility
- An overview of audio descriptions for various types of presentations; live, recorded and online.
- Tutorials for adding audio descriptions to audio files using SMIL and MAGpie

What is Audio Description?

Audio descriptions are simply additional narrative tracks that describe the current scene or setting. To aid individuals who blind or low vision, it is necessary to insert an audible description of the visual content. Concise, objective descriptions inserted between portions of dialogue or song can assist listeners to understand important visual statements. Audio description is meant to complement a performance, not interfere with it. Audio description requires both writing and voice talent specialized to audio descriptions.

An audio description can be used to describe any important on-screen elements such as:

- Settings and Scene Changes
- Actions and Graphics
- Gestures and Body Language
- Costumes

Use your best judgment for deciding which elements of each video require audio descriptions. They are subjective by nature and will vary by each video that are broadcast live or taped and redistributed.

Live and Recorded Media: Audio Description

In the television and movie industry, audio descriptions are referred to as descriptive video or video descriptions, and they may be added to a popular film in a special DVS (Descriptive Video Service) version.

Audio description of live and recorded media requires a trained audio describer who is an experienced writer and researcher.

For pre-recorded videos, the trained describer should become familiar with the content of the presentation or performance and create a script for the audio description.

For live performances or presentations, the trained describer should attend the practice

performances or read the performance script.

For recording narration to complement a video or film, the trained describer will need access to a recording studio where narration can be recorded and timed to match the video or film.

For audio description in a theater (live or pre-recorded), a device to transmit the audio descriptions and multiple receivers for visitors to wear. Individuals requiring audio description are given headsets/earplugs attached to receivers, often the size of a pocket calculator. An FM radio or infrared transmitter located in the theater broadcasts the live or taped audio descriptions into the audience.

In conclusion, the trained audio describer must identify which images are critical to understand the program, and then convey a description in as few words, in as little time, and with as much objectivity as possible. Persons listening to the descriptions should be allowed to arrive at their own conclusions as do persons who don't require the descriptions.

Live and Recorded Media: Audio Description Examples

Examples of audio described rich media from NCAM Rich Media Accessibility

For a tutorial on considerations when you describe images, visit CAST's Image Lab (http://www.cast.org).

The Independent Television Commission (ITC) entitled "ITC Guidance on Standards for Audio Description. This s document can help you assess the quality of outsourced audio description services. ITC_Guidance_On_Standards_for_Audio_Description.doc

Online Multimedia: Audio Description

The solution to providing access to rich media for individuals who are blind or visually impaired is to provide either:

- Audio Descriptions - Typically added as supplemental narrative to the audio tracks of a video file, generally in audio form
- Asynchronous Text Alternative - Text document not embedded within multimedia.

Add Audio Descriptions to Online Multimedia Content

SMIL 1.0 is capable of synchronizing audio description sound files with a video, and this can also be accomplished with QuickTime, using the 'pro' version or using QuickTime SMIL. Creating extended audio descriptions is possible technically, but laborious in practice. The not-yet-released SMIL 2.0 recommendation provides additional functionalities, including a new tag which can be used to easily add extended audio descriptions.

Tutorials:

Adding audio descriptions in QuickTime
Adding audio descriptions in SMIL 1.0
Adding extended audio descriptions in QuickTime
Adding extended audio descriptions in SMIL 1.0

SMIL 2.0

W3C SMIL 2.0 provides developers the ability to create a multimedia presentation that includes extended and normal audio description, and will allow the user to choose to hear the description or not. Users need only to modify their Rich Media Player's preferences. This solution allows developers to produce one version of a multimedia presentation that is accessible to everyone.

SMIL 2.0 provides developers with the ability to create audio descriptions that are "extended". The video and program audio of a multimedia presentation can be paused to allow an audio description to be inserted in a space where there would normally be insufficient time. Extended audio descriptions are particularly useful in settings where there is an abundance of important information which is presented quickly but not thoroughly described. For example in an online college physics lecture or in a technical advisory where techniques are shown.

Adding Audio Descriptions Basic Proceduree with MAGpie Example (Hard Copy Only)

Tutorial: Creating Audio Descriptions for Rich Media

Adding Audio Descriptions with SMIL 1.0

This tutorial assumes that you already have audio description files, either as one long file or as several short files.

Writing the SMIL

The biggest challenge in adding audio descriptions is the timing. MAGpie 1.0 is a free tool which can be used to determine the exact times when audio descriptions need to be added. Once the exact times are determined, adding the necessary markup in the SMIL is easy.

Audio descriptions all in one continuous file:

If your descriptions are in one file, you will need to use 'clip-begin' and either 'dur' or 'clip-end' to set the starting and ending times for each description. The final <audio> tag in the example below assumes that the end of the last segment of "ad.wav" coincides with the end of the file.

<body>

```
 <par>
          <video src="video.mpg" region="videoregion"/>
          <audio src="ad.wav" begin="11.34s" clip-begin="0s" dur="2.3s"/>
          <audio src="ad.wav" begin="20.12s" clip-begin="3.1s" dur="2.1s"/>
          <audio src="ad.wav" begin="26.76s" clip-begin="6.4s" dur=1.1s"/>
          <audio src="ad.wav" begin="32.94s" clip-begin="8.0s"/>
 </par>
</body>
```

Audio descriptions in separate files:

When descriptions are in separate files, you will need to add fewer attributes to each <audio> tag, but you wind up with a greater number of audio files. the markup below is the same as the markup above, except for the changes necessary to accommodate the separate files.

```
<body>
 <par>
          <video src="video.mpg" region="videoregion"/>
          <audio src="ad1.wav" begin="11.34s"/>
          <audio src="ad2.wav" begin="20.12s"/>
          <audio src="ad3.wav" begin="26.76s"/>
          <audio src="ad4.wav" begin="32.94s"/>
 </par>
</body>
```

Adding Extended Audio Descriptions with SMIL 1.0

SMIL 1.0, unlike SMIL 2.0, does not have any formal mechanism for adding audio descriptions which pause the timeline of the main media. However, at the time this document is being created, the major players do not yet support SMIL 2.0, so this technique provides a way to include extended audio descriptions with SMIL 1.0. This technique is fine in theory, but often the players that support smil 1.0 have a difficult time, so we suggest thorough testing.

Sample SMIL and explanation

```
<body>

 <par>
  <seq>

   <par>
    <video src="video.rm" region="videoregion" clip-begin="0s" clip-end="5.4"
    dur="8.7" fill="freeze"/>
    <audio src="no1.wav" begin="5.4"/>
   </par>

   <par>
```

```
    <video src="video.rm" region="videoregion" clip-begin="5.4" clip-end="24.1"
    dur="20.3" fill="freeze"/>
    <audio src="no2.wav" begin="18.7"/>
   </par>

   <par>
    <video src="video.rm" region="videoregion" clip-begin="24.1" clip-end="29.6"
    dur="7.7" fill="freeze"/>
    <audio src="no3.wav" begin="5.5"/>
   </par>

   <par>
    <video src="video.rm" region="videoregion" clip-begin="29.6" clip-end="34.5"
    dur="5.7" fill="freeze"/>
    <audio src="no4.wav" begin="4.9"/>
   </par>

   <par>
    <video src="video.rm" region="videoregion" clip-begin="77.4"/>
   </par>

  </seq>
 </par>

</body>
```

The markup above is broken into five <par> segments. In each, there is a <video> and an <audio> tag (the last <par> has no <audio> tag intentionally). The convention with extended audio desciptions is that the main media pauses during the description. The way to make this happen in SMIL is to set a "clip-begin" and "clip-end" which dictate the start and end of the video clip, and to set a duration for the clip that is longer than what is defined by the "clip-begin" and "clip-end". The fill="freeze" holds the last frame of the video during the extended description. The <audio> tag has a "begin" attribute with a value that is equal to the "clip-end" value of the preceeding <video> tag.

The way to determine the values for "clip-begin", "clip-end", and "dur" is to find out the time the portion of the video before the audio description starts and ends, and to find out the total length of the extended audio description. The "clip-begin" and "clip-end" define their own values, but the "dur" value is the sum of the length of the extended description and the clip defined by the "clip-begin" and "clip-end". In the first <par>, the video clip starts at 0 seconds, ends and 5.4 seconds, and the description length is 3.3 seconds, so the "dur" value is 5.4s + 3.3s = 8.7s.

The math is simple and repetitive. If you change an audio description you will most likely need to modify all of the 'downstream' timecodes. There is a spreadsheet that does the math

for you, to help maintain your sanity (Excel 4.0).

Adding Audio Descriptions to Multimedia with MAGpie 2.0

The audio-description capabilities of MAGpie 2.0 have been greatly improved from the previous version of the software. The user can now record audio descriptions directly into MAGpie, instead of having to use a separate sound-recording application. Audio descriptions may be recorded to fit into existing pauses in the original media's soundtrack, or the user may choose to pause the media and insert an extended audio description. Timing is handled similarly to captions in that the user plays the original media and presses a single key to assign a playback timecode to each audio description. Audio descriptions may be reviewed, re-recorded or re-timed as necessary before automatically integrating them into a QuickTime, RealPlayer or GRiNS SMIL presentation. (Microsoft's SAMI format does not currently support audio descriptions.)

Part 2: Video and Multimedia Products Resources

This section of the training outlines will cover the following video and multimedia products resources available:

- WGBH NCAM Rich Media Accessibility
- WGBH Caption Center Online
- NCAM Media Access Generator (MAGpie)
- Microsoft Corporation SAMI
- Web AIM MAGpie/SAMI tutorial

CPB/WGBH National Center for Accessible Media (NCAM)

The CPB/WGBH National Center for Accessible Media (NCAM) is a research and development facility dedicated to the issues of media and information technology for people with disabilities in their homes, schools, workplaces, and communities.

NCAM's mission is: to expand access to present and future media for people with disabilities; to explore how existing access technologies may benefit other populations; to represent its constituents in industry, policy and legislative circles; and to provide access to educational and media technologies for special needs students.

Rich Media Accessibility

A Resource Center for Developers of Rich Media

http://ncam.wgbh.org/richmedia/index.html

Welcome to the Rich Media Resource Center, a growing collection of resources for developers and users interested in ways to make rich media accessible to people with disabilities. If you are unclear on what it is, read our definition of rich media.

The site has resources organized in five categories:

Showcase: a showcase of examples of accessible rich media, with links to resources to help implement similar solutions.

http://ncam.wgbh.org/richmedia/showcase.html

Tools: a collection of links to learn about or download tools for rich media authoring and viewing, with an emphasis on tools related to rich media accessibility.

http://ncam.wgbh.org/richmedia/tools.html

Learning: current research and development pathways to help developers understand and deal

with rich media accessibility issues. Tutorials on captioning audio, describing video, and making maps and other forms of rich media accessible; strategies for dealing with player and cross platform issues; and matrices to compare features and issues of different players and methods of delivering rich media.

http://ncam.wgbh.org/richmedia/learning.html

News: current news related to rich media accessibility, including notices of major events in NCAM's rich media project.

http://ncam.wgbh.org/richmedia/news.html

FAQ: a collection of accessibility-related questions commonly asked by developers and users of rich media, with links to relevant resources.

http://ncam.wgbh.org/richmedia/faq.html

WGBH/The Caption Center Online

http://main.wgbh.org/wgbh/pages/captioncenter/

The Caption Center is the world's first captioning agency and a non-profit service of the WGBH Educational Foundation. With offices in Boston, Los Angeles and New York, The Caption Center captions nearly 250 hours per week of programming from all segments of the television industry. Our work includes such programs as *Biography, The CBS Evening News with Dan Rather, The Daily Show with Jon Stewart, E.R., the Late Show with David Letterman, Malcolm in the Middle, NOVA, The Real World, Rugrats, 60 Minutes* and *Survivor* as well as thousands of music videos, home videos and selected feature films.

The Caption Center was WGBH's first venture into the field of accessible media. Descriptive Video Service (DVS(r)), which provides narrated elements of a program's visual content during breaks in dialogue, began serving visually impaired viewers in 1990. The CPB/WGBH National Center for Accessible Media (NCAM) continues the tradition of reaching out to under-served audiences excluded from mass media due to language, geographic or physical barriers.

Feature Article: Suggested Styles and Conventions for Closed Captioning

http://main.wgbh.org/wgbh/pages/captioncenter/ccstyles.html

This brief description of captioning style was distilled from The Caption Center's in-house reference manual. It is being made available in the hope that exchanging our ideas might move the captioning industry at large toward a greater consistency of style.

WGBH/ Descriptive Video Service

Since 1986 Descriptive Video Service (DVS) has been turning pictures into words enabling thousands of people who are blind or have low vision to more fully enjoy television and movies on video. The DVS production team weaves carefully crafted descriptions of a program or movie's key visual elements into the natural pauses of the program or movie dialogue.

Media Access Generator (MAGpie)
http://ncam.wgbh.org/webaccess/magpie/

Developers of Web-and CD-ROM-based mulitmedia need an authoring tool for making materials accessible to individuals with disabilities. Using MAGpie, authors can add captions to three multimedia formats: Apple's Quick Time, the World Wide Web Consotium Synchronized Multimedia Intrgration Language (SMIL), and Microsoft's Synchronized Accessible Media Interchange (SAMI) format. MAGpie can also integrate audio descriptions into SAMI presentations.

Usig MAGpie 2.0 (Media Access Generator, version 2.0) from NCAM
http://www.csun.edu.cod/conf2002/proceddings/51.htm

MAGpie, NCAM's digital captioning application, orginally released in mid-2000, has been redesigned and re-released as version 2.0. Intended to simplify the process of adding closed captions and audio descriprions to digital media. MAGpie 2.0 expands and improves the application's original capabilities.

Captioing Web: Software/Hardware

http://www.captions.org/softlinks.cfm

Provides a list of Company Name and Product List that offer captioning services.

Captioning Checklist and Time & Cost Consideration Matrix

A tool when comparing a captioning company or service

Trace Resreach and Development Center
Resources on Captioning Computer Delivered Video

http://newmedia.doit.wisc.edu/staff/wolf/caption.html

Microsoft Synchronized Accessible Media Interchange (SAMI)
http://msdn.microsoft.com/library

Understanding SAMI 1.0

Microsoft® Synchronized Accessible Media Interchange (SAMI) simplifies captioning for developers, educators, and multimedia producers and designers who will now find it easier to make their work more universally accessible. The SAMI file format specification is available to the public as an open (no licensing fees) standard.

Familiar to television viewers, captioning was developed initially by WGBH, the public television station in Boston, for the estimated 20 million Americans who were deaf or hard of hearing. Now, the new SAMI technology expands the ability to provide closed captioning to a wide range of multimedia products. The sole purpose of this document is to cover captioning technology used in PC multimedia. Television captioning is not covered in this document.

This document development and update have been helped by the CPB/WGBH National Center for Accessible Media (NCAM). For more information, see the NCAM Web site.

Captioning Technologies for PC Multimedia
http://msdn.microsoft.com/library

SAMI is not the only captioning technology available for PC multimedia today. Multimedia producers and HTML authors can choose the technologies most suitable for them.

World Wide Web Consortium (W3C) SMIL
http://www.w3c.org/AudioVideo/

The Synchronized Multimedia Integration Language™ (SMIL) enables simple authoring of interactive audiovisual presentations. SMIL is typically used for "rich media"/multimedia presentations which integrate streaming audio and video with images, text or any other media type. SMIL is an easy-to-learn HTML-like language, and many SMIL presentations are written using a simple text-editor.

Apple Quick Time Tutorials

http://www.apple.com/quicktime/products/tutorials/

The comprehensive Apple tutorials are divided into 3 sections: Basic, Interactive and Delivery for creating Quick Time multimedia presentations.

Web Accessibility in Mind (WebAIM)

http://www.webaim.org

Introduction to MAGpie

The Media Access Generator (MAGpie) toll is designed to make it easy for multimedia content developers to add captions to their audio and video content. MAGpie provides an environment for developers to listen to their content, add captions and synchronize the captions to the content by adding a time code to each event.

WebAIM MAGpie Output Reference

http://www.webaim.org.howto/magpie/outputref/

This document displays the sample output and files created for each of the following media players: SAMI, SMIL and Quick Time

WebAIM To Embed or Not to Embed – A Comparison of Media Player Technologies
http://www.webaim.org/articles/embeddedmp.php

WebAIM tested the accessibility of each of the media payers (Windows Media Player, Quick Time, and RealMedia Player) as an embedded object in a web page and as a standalone application. The players were tested for keyboard accessibility and the screen reader compatibility. The results of the comparison test are discussed in this document.

Accessible Practices Best Practices
Live and Recorded Media: Audio Description
http://www.astc.org/resource/access/medad.htm

This document presents an overview of audio description and who uses it, terminology, examples and equipment needed for audio description of live and recorded media.

Federal Communications Commission FCC'S FACT SHEETS on Video Description and Closed Captioning

Video Description http://www.fcc.gov/cgb/consumerfacts/vid_des.html

Closed Captioning http://www.fcc.gov/cgb/consumerfacts/closedcaption.html

Creating Video and Multimedia Products that are Accessible to People with Sensory Impairments http://www.washington.edu/doit/Brochures/Technology/vid_sensory.html

FAA personnel should visit the following website: http://ncam.wgbh.org/richmedia/ Within two months, WGBH plans to change the content of this site to include web-based resources that will assist in captioning. If the web site does not answer your questions, FAA personnel should send inquiries about Multimedia and Video to: Andrew_Kirkpatrick@wgbh.org with a cc: to Deborah.Douglas-slade@faa.gov, FAA Section 508 Coordinator. WGBH is interested in understanding the accessibility issues that the agency encounters and is willing to offer assistance.

Please use the learning tutorials as examples for captioning and audio descriptions at the below web site:

http://ncam.wgbh.org/richmedia/learning.html

Video and multimedia products information from the Section 508 web site.

Use of EIT in Federal Agency Training

Question: If a Federal agency conducts training and uses multimedia, such as videotapes or computer based training, must the materials developed be accessible under 508?

Answer: Yes. Multimedia is considered EIT and, if used by the Federal government, must be accessible unless an exception applies (see sections F and G, below). Section 1194.22 of the Access Board's standards addresses requirements for web-based intranet and internet information and applications. Section 1194.24 addresses video and multimedia products. In addition to the requirements of section 508, agencies also have obligations to their employees under sections 501 and 504 of the Rehabilitation Act.

Question: If a Federal agency is distributing a television or multimedia production or a web-cast presentation, does it have to be open or closed captioned and audio-described?

Answer: Section 1194.24(c) and (d) of the Access Board's standards require that all training or informational video and multimedia productions which support the agency's mission and which have audio information or visual information that is necessary for the comprehension of the

content, be captioned or audio described. Hence, if the production is multimedia (e.g. image and sound) and is considered "training or informational," then it must meet the applicable requirements of 1194.24 (c) and (d) of the Access Board's standards. If the production is web-based, regardless of whether it is multimedia, such as a live webcast of a speech, then it must also meet the applicable requirements of 1194.22.

Question: Does the requirement to open or close caption and audio describe apply to productions that have a limited purpose, scope, and shelf life or contain quickly "perishable" information?

Answer: Section 1194.22 of the Access Board standards applies requirements to web-based intranet and internet information and applications without regard to the perishable nature of a production. Similarly, section 1194.24 addresses video and multimedia products without regard to the shelf life of a production.

Question: Do videotapes of briefings or "raw or stock" film footage for documentation purposes have to be captioned or audio described? What if the videotape is later played for an audience? Do graphs and charts used in the briefing have to be audio described?

Answer: Briefings or other recordings made for purposes of documentation are not considered "training or informational videos." As noted in the preamble to the Access Board's final rule, section 1194.24 does not require that a videotape recorded by a field investigator to document a safety violation be captioned or audio described. However, if such a videotape were subsequently used as part of a training or informational presentation, it would have to be captioned and audio described. (See 65 Federal Register 80517, December 21, 2000.) Any graphs or charts that are not described in the narration of the video would have to be audio described if the visual information was necessary for the comprehension of the content.

Question: Is the requirement to open or close caption, and to provide audio description specific to English?

Answer: **No**. The requirement to caption (i.e., to provide access to audio information for persons with hearing impairments) and provide audio description applies irrespective of the language. It is recommended that captioning and audio description be in the same language as the content of the production. For example, Spanish audio should be captioned in Spanish. There is no requirement to provide captioning in a language different from the content of the production (e.g., English audio need not be in Spanish or vice versa.)

Question: Must the lyrics in songs embedded in productions be open or closed captioned?

Answer: This answer depends on whether the lyrics are considered content essential for comprehension. For instance, a production that features a dialogue between two people while a

radio softly plays a song in the background should have the conversation in the foreground captioned. However, since the song from the radio is not essential for comprehension, the captions could simply indicate that music is playing in the background.

FAA Access Board Links:
Section 508 Standards:

EIT Accessibility Standards (Section 508)

Technical Guides:

Software Applications and Operating Systems (1194.21)

Web-based Intranet and Internet Information and Applications (1194.22)

Telecommunication Products (1194.23)

Video and Multimedia Products (1194.24)

Self-Contained, Closed Products (1194.25)

Desktop and Portable Computers (1194.26)

Summaries of EIT Accessibility Standards Sections

Summary of Software Applications and Operating Systems
Access Board's summary of Software Applications and Operating Systems (1194.21)

Summary of Web-based Intranet and Internet Information and Applications
Access Board's summary of Web-based Intranet and Internet Information and Applications (1194.22)

Summary of Telecommunication Products
Access Board's summary of Telecommunication Products (1194.23)

Summary of Video and Multimedia Products
Access Board's summary of Video and Multimedia Products (1194.24)

Summary of Self-Contained, Closed Products
Access Board's summary of Self-Contained, Closed Products (1194.25)

Summary of Desktop and Portable Computers
Access Board's summary of Desktop and Portable Computers (1194.26)

Video and Multimedia Products Resource Guide Website List

Captioning Resources:
http://main.wgbh.org/wgbh/pages/captioncenter
http://main.wgbh.org/wgbh/pages/captioncenter/ccstyles.html

Access Board Resources:
http://www.access-board.gov/sec508/guide/guide/1194.24-decoderact.htm

Realtime Captioning List:
http://captions.org/softlinks.cfm

Captioning Computer Delivered Video:
http://newmedia.doit.wis.edu/staff/wolf/caption.html
http://msdn.micrsoft.com/library/en-us/dnass/html/ATG-CcandAudioDesc.asp
http://ncam.wgbh.org/webaccess/magpie
http://www.apple.com/quicktime/products/tutorials
http://www.w3.org/AudioVideo
http://msdn.microsoft.com/library/en-us/dnacc/html/atg_samiarticle.asp?frame=true
http://www.csun.edu/cod/conf2001/proceedings/0171banks.html
http://www.webaim.org/articles/embeddedmp.php

Audio Description:
http://www.astc.org/resource/access/medad.htm

Video Description:
http://www.fcc.gov/cgb/consumerfacts/vid_des.html

Closed Captioning:
http://ftp.fcc.gov/cgb/consumerfacts/closedcaption.html

Captions and Audio Descriptions for PC Multimedia:
http://www.washington.edu/doit/Brochures/Technology/vid_sensory.html